



September 29, 2022

EES Case Management Unit
Environment and Natural Resources Division
United States Department of Justice
P.O. Box 7611
Washington, D.C. 20044-7611

Re: DOJ # 90-5-2-1-11114
Submittal of Semi-Annual Report
Consent Decree 2:21-00114-MLCF-JVM
The Dow Chemical Company
Orange, TX

CERTIFIED MAIL/RETURN RECEIPT REQUESTED

7020 2450 0001 8240 8241

Dear Sir/Madam:

The Dow Chemical Company is submitting a Semi-Annual Report for all of the Covered Flares at the Orange, TX site for the period of January 1, 2022 through June 30, 2022. This information is being submitted in accordance with Paragraph 63 of the subject Consent Decree.

Please contact Elaine Schroeder at 979-238-7904 or eschroeder@dow.com if you have any questions regarding this submittal.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Hedges", with a long horizontal line extending to the right.

Dustin Hedges
Responsible Care Director
Sabine River Operations
The Dow Chemical Company

Attachments

cc:

Cover Letter Only

United States Attorney
Eastern District of Louisiana
650 Poydras Street
Suite 1600
New Orleans, LA 70130

First-Class Mail - Cover Letter and Attachments

Director, Air Enforcement Division
Office of Civil Enforcement
United States Environmental Protection Agency
Mail Code 2242-A
1200 Pennsylvania Ave, N.W.
William Jefferson Clinton Building
Room 1119
Washington, DC 20460-0001

Associate Director
Air, Toxics, and Inspections Coordination
Branch (6 EN-A)
United States EPA, Region 6
1201 Elm Street, Suite 500
Dallas, Texas 75270-2102

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The Dow Chemical Company
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Lake Jackson, TX 77566

Semi-Annual Report
For Covered Flares
Orange Flares:
CDG
Ethylene

Submitted by
The Dow Chemical Company

September 29, 2022

Orange, TX
Table of Contents for Semi-Annual Report

Tab	Description of Contents
1 - Report CDG Flare	Information Required in Paragraphs 31, 38g., 39b., and Paragraphs 63.a. through 63.i. for this Covered Flare
1 - Report Ethylene Flare	Information Required in Paragraphs 31, 38g., 39b., and Paragraphs 63.a. through 63.i. for this Covered Flare
2-Instrument Downtime Details	Information on instrument downtime for all instruments associated with all Covered Flares at this site (Paragraph 63.h.(2)).
3-NHVcz and Compliance Details	Information on periods of low NHVvg or low NHVcz associated with all Covered Flares at this site (Paragraph 63.h.(4)(B)), and information on any problems encountered or anticipated in meeting the requirements in Section V (Compliance Requirements). (Paragraph 63.b.)
4-FGRS Details	Information on periods of FGRS Shutdowns per Paragraph 38.g. and periods of non-compliance with compressor availability requirements (Paragraph 63.h.(5)).
5-Annual Emissions	Information Required by Paragraph 65. on annual emissions associated with all Covered Flares at this site .
6-Reportable Flaring Incidents	Information Required in Paragraph 34.b. - A summary of Reportable Flaring Incidents associated with all Covered Flares at this site.
7-Fenceline Monitoring Reports	Information Required by Paragraph 64.a. and b. regarding Fenceline Air Monitoring Reports at this site.
8-Flare List	List of Covered Flares at all 4 Sites

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - CDG

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - CDG
63.a.	A description of the status of work performed and progress made toward implementing all requirements of Section V (Compliance Requirements) at the Covered Facilities. This topic should describe any major milestones completed and remaining to be completed;	In accordance with Appendix 1.6 Item 3, vent gas and steam flowmeters were upgraded. This project was put into service on June 12, 2022.
63.b. and 39.b.	A description of any problems encountered or anticipated in meeting the requirements in Section V (Compliance Requirements) at the Covered Facilities, together with implemented or proposed solutions;	Please refer to 3-NHVcz and Compliance Details for further information.
63.c.	A description of the status of any permit applications, including a summary of all permitting activity, pertaining to compliance with this Consent Decree;	There are no current permit applications pertaining to compliance with this Consent Decree.
63.d.	A copy of any reports that were submitted only to LDEQ and that pertain to compliance with this Consent Decree; (applies to Hahnville and Plaquemine, LA sites)	This information is covered in the semi-annual reports prepared by the Louisiana sites.
63.e.	A description of the Applicable Defendant's(s') progress in satisfying its(their) obligations in connection with the BEP(s) under Section VI including, at a minimum, a narrative description of activities undertaken; status of any construction or compliance measures, including the completion of any milestones set forth in the BEP Work Plan (attached as Appendix 2.1), and a summary of costs incurred since the previous report; (applies to Hahnville and Plaquemine, LA sites)	This information was submitted along with the initial semi-annual report cover letter for the Louisiana site(s) semi-annual reports in March 2022.
63.f. and 31.	Any updated WGMP for the Covered Facilities that is required to be submitted by Paragraph 31;	The initial WGMP was submitted on June 9, 2022.

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - CDG

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - CDG
63.g.	Any summary of internal flaring incident reports as required by Paragraph 34;	The Reportable Flaring Incidents program commenced on June 10, 2022 (365 days after the effective date). There have been no Reportable Flaring Incidents during the reporting period.
63.h.	A summary of the following, per Covered Flare per Calendar Quarter (hours must be rounded to the nearest tenth):	
63.h.(1)	The total number of hours of Instrument Downtime claimed pursuant to Paragraph 45, expressed as both an absolute number and a percentage of time the Covered Flare that the instrument/equipment monitors, is In Operation and Capable of Receiving Sweep, Supplemental, and/or Waste Gas;	
	Vent Gas flow monitor Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0
	Vent Gas flow monitor Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Pressure monitor associated with Vent Gas Flow monitor (hours)	1Q 2022 = 0 2Q 2022 = 0
	Pressure monitor associated with Vent Gas Flow monitor (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Temperature monitor associated with Vent Gas Flow monitor (hours)	1Q 2022 = 0 2Q 2022 = 0
	Temperature monitor associated with Vent Gas Flow monitor (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - CDG

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - CDG
	Steam flow monitor Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0
	Steam flow monitor Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Pressure monitor associated with Steam Flow monitor (hours)	1Q 2022 = 0 2Q 2022 = 0
	Pressure monitor associated with Steam Flow monitor (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Temperature monitor associated with Steam Flow monitor (hours)	1Q 2022 = 0 2Q 2022 = 0
	Temperature monitor associated with Steam Flow monitor (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Calorimeter Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0
	Calorimeter Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Hydrogen Analyzer Downtime (hours)	N/A
	Hydrogen Analyzer Downtime (percentage of time)	N/A
	On-Line Gas Chromatograph (GC) Downtime (hours)	N/A
	On-Line Gas Chromatograph (GC) Downtime (percentage of time)	N/A

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - CDG

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - CDG
	Flare Video Camera Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0
	Flare Video Camera Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Flare Video Recording System Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0
	Flare Video Recording System Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Other Monitoring System Downtime (hours)	N/A
	Other Monitoring System Downtime (percentage of time)	N/A
63.h.(2)	(2) If the total number of hours of Instrument Downtime claimed pursuant to Paragraph 45 exceeds 110 hours in a Calendar Quarter the Covered Flare affected by the downtime is In Operation, an identification of the periods of downtime by date, time, cause (including Malfunction or maintenance), and, if the cause is asserted to be a Malfunction, the corrective action taken;	The number of hours of Instrument Downtime did not exceed 110 hours in a calendar quarter.
63.h.(3)	(3) The total number of hours, expressed as both an absolute number of hours and a percentage of time that the Covered Flare was In Operation, in which the requirements of Paragraphs 43-44 were not applicable because the only gas or gases being vented were Pilot Gas or Purge Gas;	1Q 2022 Hours = 0 1Q 2022 Percentage = 0% 2Q 2022 Hours = 0 2Q 2022 Percentage = 0%

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - CDG

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - CDG
63.h.(4)	(4) Exceedances of Combustion Efficiency Standards.	
63.h.(4)(A)	The total number of hours, expressed as both an absolute number of hours and a percentage of time the Covered Flare was In Operation, of exceedances of the emissions standards in Paragraphs 43-44; provided however, that if the exceedance of these standards was for less than 110 hours in a Calendar Quarter and was due to one or more of the exceptions set forth in Paragraph 45, the report must so note; and	1Q 2022 Hours = 4.25 1Q 2022 Percentage = 0.2% 2Q 2022 Hours = 2.75 2Q 2022 Percentage = 0.13%
63.h.(4)(B)	If the exceedance of the emissions standards in Paragraphs 43-44 was not due to one of the exceptions in Paragraph 45 (Instrument Downtime), or if the exceedance was due to one or more of the exceptions in Paragraph 45 and the total number of hours caused by the exceptions exceeds 110 hours in a Calendar Quarter that the Covered Flare affected by the Instrument Downtime was In Operation, an identification of each block period that exceeded the standard, by time and date; the cause of the exceedance (including startup, shutdown, maintenance, or Malfunction), and if the cause is asserted to be a Malfunction, an explanation and any corrective actions taken; and	See 3 - NHVcz and Compliance Details, as applicable for this flare.
63.h.(5)	(5) <u>Compliance with Compressor Availability Requirements</u> . Sufficient information to document compliance with the FGRS Compressor availability requirements of sub-Paragraph 38.e. For any period of non-compliance, the Applicable Defendant(s) must identify the date, cause, and corrective action taken.	A FGRS will not be installed for this flare
63.h.(5) and 38.g.	Provide details on each outage of a Flare Gas Recovery System (FGRS) where the FGRS was shutdown (including the subsequent restart) due to operating conditions (such as high temperatures or large quantities of entrained liquid in the Vent Gas) outside the design operating range of the FGRS, including the associated knock-out drum(s), such that an outage is necessary for safety or to preserve the mechanical integrity of the FGRS. Describe each outage that occurred under these conditions, including the date, duration, cause(s), corrective action, and the status of the implementation of corrective action.	A FGRS will not be installed for this flare

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - CDG

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - CDG
63.i.	Any additional matters that the Applicable Defendant(s) believe should be brought to the attention of EPA, or LDEQ for the Hahnville and Plaquemine Facilities.	Nothing at this time.
64	<u>Fenceline Air Monitoring Reports</u> . The Applicable Defendant(s) must submit Fenceline Air Monitoring Reports as part of each Semi-Annual Report. The Fenceline Air Monitoring Reports must contain the following information:	Sitewide Requirement - The fenceline ambient air monitoring program commenced prior to June 10, 2022. The information required in paragraphs 64.a. and b. is available in the tab titled "7-Fenceline Monitoring Reports".
64.a.	a. In spreadsheet format, the individual sample results for each monitor comprising each Fenceline Monitoring System, each bi-weekly annual average benzene concentration difference value (once annual averages are available), and the corresponding meteorological data for the relevant monitoring periods. The first two columns of each spreadsheet must be the date and time for each sample taken; and	
64.b.	b. A detailed description of the findings of any root cause analysis and corrective action(s) undertaken pursuant to Paragraph 3(g) of Appendix 2.2, including the known results of the corrective action(s) and the anticipated emissions reductions (in TPY per pollutant).	

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - CDG

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - CDG
65	<p><u>Annual Emissions Data.</u> In the Semi-Annual Report that is submitted by or on March 31 of each year, the Applicable Defendant(s) must provide, for each Covered Flare, for the prior calendar year, the amount of emissions of the following compounds (in tons per year): VOCs, HAPs, NOx, CO2, methane, and ethane. Each Semi-Annual Report must also include a description of any non-compliance with the requirements of this Consent Decree not otherwise identified by Paragraph 63 along with an explanation of the violation's likely cause and of the remedial steps taken, or to be taken, to prevent or minimize such violation. If the cause of a violation cannot be fully explained at the time the report is due, the Applicable Defendant(s) must so state in the report. In such a case, the Applicable Defendant(s) must investigate the cause of the violation and then submit an amendment to the report, including a full explanation of the cause of the violation, within thirty Days of the Day the Applicable Defendant(s) become aware of the cause of the violation. Nothing in this Paragraph or the following Paragraph relieves the Applicable Defendant(s) of its(their) obligation to provide the notice required by Section XI (Force Majeure).</p>	<p>The annual emissions data for Year 2022 for each flare will be provided on the tab "5-Annual Emissions" during the March 2023 report.</p> <p>There were no other noncompliances with the requirements of this Consent Decree that have not been already referenced.</p>

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - Ethylene

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - Ethylene
63.a.	A description of the status of work performed and progress made toward implementing all requirements of Section V (Compliance Requirements) at the Covered Facilities. This topic should describe any major milestones completed and remaining to be completed;	All projects have been completed to implement the requirements of Section V.
63.b. and 39.b.	A description of any problems encountered or anticipated in meeting the requirements in Section V (Compliance Requirements) at the Covered Facilities, together with implemented or proposed solutions;	No problems have been encountered or anticipated in meeting the requirements in Section V.
63.c.	A description of the status of any permit applications, including a summary of all permitting activity, pertaining to compliance with this Consent Decree;	There are no current permit applications pertaining to compliance with this Consent Decree.
63.d.	A copy of any reports that were submitted only to LDEQ and that pertain to compliance with this Consent Decree; (applies to Hahnville and Plaquemine, LA sites)	This information is covered in the semi-annual reports prepared by the Louisiana sites.
63.e.	A description of the Applicable Defendant's(s') progress in satisfying its(their) obligations in connection with the BEP(s) under Section VI including, at a minimum, a narrative description of activities undertaken; status of any construction or compliance measures, including the completion of any milestones set forth in the BEP Work Plan (attached as Appendix 2.1), and a summary of costs incurred since the previous report; (applies to Hahnville and Plaquemine, LA sites)	This information was submitted along with the initial semi-annual report cover letter for the Louisiana site(s) semi-annual reports in March 2022.
63.f. and 31.	Any updated WGMP for the Covered Facilities that is required to be submitted by Paragraph 31;	The initial WGMP was submitted on June 9, 2022.

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - Ethylene

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - Ethylene
63.g.	Any summary of internal flaring incident reports as required by Paragraph 34;	The Reportable Flaring Incidents program commenced on June 10, 2022 (365 days after the effective date). A summary of Reportable Flaring Incident reports is provided on the tab titled "6-Reportable Flaring Incidents".
63.h.	A summary of the following, per Covered Flare per Calendar Quarter (hours must be rounded to the nearest tenth):	
63.h.(1)	The total number of hours of Instrument Downtime claimed pursuant to Paragraph 45, expressed as both an absolute number and a percentage of time the Covered Flare that the instrument/equipment monitors, is In Operation and Capable of Receiving Sweep, Supplemental, and/or Waste Gas;	
	Vent Gas flow monitor Downtime (hours)	1Q 2022 = 49.5 2Q 2022 = 0
	Vent Gas flow monitor Downtime (percentage of time)	1Q 2022 = 2.29% 2Q 2022 = 0%
	Pressure monitor associated with Vent Gas Flow monitor (hours)	1Q 2022 = 0 2Q 2022 = 0
	Pressure monitor associated with Vent Gas Flow monitor (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Temperature monitor associated with Vent Gas Flow monitor (hours)	1Q 2022 = 0 2Q 2022 = 0
	Temperature monitor associated with Vent Gas Flow monitor (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Steam flow monitor Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - Ethylene

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - Ethylene
	Steam flow monitor Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Pressure monitor associated with Steam Flow monitor (hours)	1Q 2022 = 0 2Q 2022 = 0
	Pressure monitor associated with Steam Flow monitor (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Temperature monitor associated with Steam Flow monitor (hours)	1Q 2022 = 0 2Q 2022 = 0
	Temperature monitor associated with Steam Flow monitor (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Calorimeter Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0
	Calorimeter Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Hydrogen Analyzer Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0
	Hydrogen Analyzer Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	On-Line Gas Chromatograph (GC) Downtime (hours)	N/A
	On-Line Gas Chromatograph (GC) Downtime (percentage of time)	N/A
	Flare Video Camera Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0
	Flare Video Camera Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Flare Video Recording System Downtime (hours)	1Q 2022 = 0 2Q 2022 = 0

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - Ethylene

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - Ethylene
	Flare Video Recording System Downtime (percentage of time)	1Q 2022 = 0% 2Q 2022 = 0%
	Other Monitoring System Downtime (hours)	N/A
	Other Monitoring System Downtime (percentage of time)	N/A
63.h.(2)	(2) If the total number of hours of Instrument Downtime claimed pursuant to Paragraph 45 exceeds 110 hours in a Calendar Quarter the Covered Flare affected by the downtime is In Operation, an identification of the periods of downtime by date, time, cause (including Malfunction or maintenance), and, if the cause is asserted to be a Malfunction, the corrective action taken;	The number of hours of Instrument Downtime did not exceed 110 hours in a calendar quarter.
63.h.(3)	(3) The total number of hours, expressed as both an absolute number of hours and a percentage of time that the Covered Flare was In Operation, in which the requirements of Paragraphs 43-44 were not applicable because the only gas or gases being vented were Pilot Gas or Purge Gas;	1Q 2022 Hours = 0 1Q 2022 Percentage = 0% 2Q 2022 Hours = 0 2Q 2022 Percentage = 0%
63.h.(4)	(4) Exceedances of Combustion Efficiency Standards.	
63.h.(4)(A)	The total number of hours, expressed as both an absolute number of hours and a percentage of time the Covered Flare was In Operation, of exceedances of the emissions standards in Paragraphs 43-44; provided however, that if the exceedance of these standards was for less than 110 hours in a Calendar Quarter and was due to one or more of the exceptions set forth in Paragraph 45, the report must so note; and	1Q 2022 Hours = 5 1Q 2022 Percentage = 0.2% 2Q 2022 Hours = 0 2Q 2022 Percentage = 0%

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - Ethylene

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - Ethylene
63.h.(4)(B)	If the exceedance of the emissions standards in Paragraphs 43-44 was not due to one of the exceptions in Paragraph 45 (Instrument Downtime), or if the exceedance was due to one or more of the exceptions in Paragraph 45 and the total number of hours caused by the exceptions exceeds 110 hours in a Calendar Quarter that the Covered Flare affected by the Instrument Downtime was In Operation, an identification of each block period that exceeded the standard, by time and date; the cause of the exceedance (including startup, shutdown, maintenance, or Malfunction), and if the cause is asserted to be a Malfunction, an explanation and any corrective actions taken; and	See 3 - NHVcz and Compliance Details, as applicable for this flare.
63.h.(5)	(5) <u>Compliance with Compressor Availability Requirements</u> . Sufficient information to document compliance with the FGRS Compressor availability requirements of sub-Paragraph 38.e. For any period of non-compliance, the Applicable Defendant(s) must identify the date, cause, and corrective action taken.	The FGRS has not yet been installed for this flare.
63.h.(5) and 38.g.	Provide details on each outage of a Flare Gas Recovery System (FGRS) where the FGRS was shutdown (including the subsequent restart) due to operating conditions (such as high temperatures or large quantities of entrained liquid in the Vent Gas) outside the design operating range of the FGRS, including the associated knock-out drum(s), such that an outage is necessary for safety or to preserve the mechanical integrity of the FGRS. Describe each outage that occurred under these conditions, including the date, duration, cause(s), corrective action, and the status of the implementation of corrective action.	The FGRS has not yet been installed for this flare.
63.i.	Any additional matters that the Applicable Defendant(s) believe should be brought to the attention of EPA, or LDEQ for the Hahnville and Plaquemine Facilities.	Nothing at this time.

Semi-Annual Report

Name of Site and Flare

Semi-Annual Reporting Period:

Report Due Date:

Orange, TX - Ethylene

January 1, 2022 - June 30, 2022

September 30, 2022

Consent Decree Paragraph(s)	Consent Decree Requirement	Orange, TX - Ethylene
64	<u>Fenceline Air Monitoring Reports</u> . The Applicable Defendant(s) must submit Fenceline Air Monitoring Reports as part of each Semi-Annual Report. The Fenceline Air Monitoring Reports must contain the following information:	Sitewide Requirement - The fenceline ambient air monitoring program commenced prior to June 10, 2022. The information required in paragraphs 64.a. and b. is available in the tab titled "7-Fenceline Monitoring Reports".
64.a.	a. In spreadsheet format, the individual sample results for each monitor comprising each Fenceline Monitoring System, each bi-weekly annual average benzene concentration difference value (once annual averages are available), and the corresponding meteorological data for the relevant monitoring periods. The first two columns of each spreadsheet must be the date and time for each sample taken; and	
64.b.	b. A detailed description of the findings of any root cause analysis and corrective action(s) undertaken pursuant to Paragraph 3(g) of Appendix 2.2, including the known results of the corrective action(s) and the anticipated emissions reductions (in TPY per pollutant).	
65	<u>Annual Emissions Data</u> . In the Semi-Annual Report that is submitted by or on March 31 of each year, the Applicable Defendant(s) must provide, for each Covered Flare, for the prior calendar year, the amount of emissions of the following compounds (in tons per year): VOCs, HAPs, NOx, CO2, methane, and ethane. Each Semi-Annual Report must also include a description of any non-compliance with the requirements of this Consent Decree not otherwise identified by Paragraph 63 along with an explanation of the violation's likely cause and of the remedial steps taken, or to be taken, to prevent or minimize such violation. If the cause of a violation cannot be fully explained at the time the report is due, the Applicable Defendant(s) must so state in the report. In such a case, the Applicable Defendant(s) must investigate the cause of the violation and then submit an amendment to the report, including a full explanation of the cause of the violation, within thirty Days of the Day the Applicable Defendant(s) become aware of the cause of the violation. Nothing in this Paragraph or the following Paragraph relieves the Applicable Defendant(s) of its(their) obligation to provide the notice required by Section XI (Force Majeure).	<p>The annual emissions data for Year 2022 for each flare will be provided on the tab "5-Annual Emissions" during the March 2023 report.</p> <p>There were no other noncompliances with the requirements of this Consent Decree that have not been already referenced.</p>

2- Instrument Downtime Details

Site: Orange, TX
Semi-Annual Reporting Period: January 1, 2022 - June 30, 2022

Paragraph 63.h.(2) Listing of Downtime Periods for Instruments that exceeded 110 hours during a calendar quarter

Site and Flare Named in CD	Monitor or Instrument with downtime > 110 hours during a calendar quarter	Start Date	Start Time	End Date	End Time	Duration - Hours (to 0.25 hour)	Cause (Including Malfunction or Maintenance)	Corrective Action(s) Taken for Malfunctions
Not Applicable: The number of hours of Instrument Downtime did not exceed 110 hours in a calendar quarter for any flare in this report.								

3-NHVcz and Compliance Details

Site: Orange, TX
Semi-Annual Reporting Period: January 1, 2022 - June 30, 2022

This form is completed for each exceedance of the emission standards in Paragraphs 43-44 that is not due to one of the exceptions in Paragraph 45 (Instrument Downtime) or if the exceedance was due to one or more of the exceptions in Paragraph 45 and the total number of hours caused by the exceptions exceeds 110 hours in a Calendar Quarter that the Covered Flare affected by the Instrument Downtime was In Operation.

Paragraph 63.h.(4)(B) Exceedance of Combustion Efficiency Standards

Block Periods of time when Covered Flare Did Not Meet NHVvg (Paragraph 43.a.) or NHVcz (Paragraph 43.b.) standards

Site and Flare Named in CD	Low NHVvg or Low NHVcz?	Start Date	Start Time	End Date	End Time	Duration - Hours (to 0.25 hour)	Cause (Including Startup, Shutdown, Maintenance, or Malfunction)	Corrective Action(s) Taken for Malfunctions
Orange, TX - CDG	NHVcz	1/24/2022	14:00	1/24/2022	15:00	1	Steam increased to prevent smoking.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	2/2/2022	15:30	2/2/2022	15:45	0.25	Steam increased to prevent smoking.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	2/28/2022	22:00	2/28/2022	23:00	1	Combustion zone BTU dropped below 270 due to G unit purging.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	3/1/2022	0:15	3/1/2022	1:00	0.75	Combustion zone BTU dropped below 270 due to G unit purging.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	3/28/2022	9:15	3/28/2022	10:30	1.25	Steam increased to prevent smoking.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	5/30/2022	9:45	5/30/2022	10:30	0.75	Combustion zone BTU dropped below 270.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	5/30/2022	11:00	5/30/2022	11:45	0.75	Combustion zone BTU dropped below 270.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	6/8/2022	11:45	6/8/2022	12:15	0.5	Combustion zone BTU dropped below 270.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	6/8/2022	13:15	6/8/2022	13:45	0.5	Combustion zone BTU dropped below 270.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - CDG	NHVcz	6/12/2022	2:15	6/12/2022	2:30	0.25	Combustion zone BTU dropped below 270.	Increased natural gas to flare and reduced nitrogen purging
Orange, TX - Ethylene	NHVvg NHVcz	3/17/2022	11:30 PM	3/17/2022	11:45 PM	0.25	NHVcz and NHVvg fell below thresholds when valve failed closed preventing forward flow.	Maintenance secured valve in the open position.
Orange, TX - Ethylene	NHVcz	3/18/2022	3:15 AM	3/18/2022	4:00 AM	0.75	NHVcz and NHVvg fell below thresholds when valve failed closed preventing forward flow.	Maintenance secured valve in the open position.
Orange, TX - Ethylene	NHVcz	3/18/2022	3:00 PM	3/18/2022	3:30 PM	0.5	NHVcz fell below 270 BTU/scf due to fluctuating process flow during startup from earlier event.	Flow stabilized and NHVcz resolved
Orange, TX - Ethylene	NHVcz	3/18/2022	3:45 PM	3/18/2022	4:00 PM	0.25	NHVcz fell below 270 BTU/scf due to fluctuating process flow during startup from earlier event.	Flow stabilized and NHVcz resolved
Orange, TX - Ethylene	NHVcz	3/21/2022	9:45 AM	3/21/2022	1:00 PM	3.25	Low NHVvg during periods of fluctuating process flow	Flow stabilized and NHVcz resolved

Paragraph 63.h.b. A description of any problems encountered or anticipated in meeting other requirements in Section V. (Compliance Requirements)

Other Problems Encountered or Anticipated in Meeting the Compliance Requirements in Section V (Paragraph 63. b.)

Site and Flare Named in CD	Problem(s) Encountered	Start Date	Start Time	End Date	End Time	Duration - Hours (to 0.25 hour)	Cause (Including Startup, Shutdown, Maintenance, or Malfunction)	Corrective Action(s) Taken
Not applicable								

4-FGRS Details

Site: Orange, TX
Semi-Annual Reporting Period: January 1, 2022 - June 30, 2022

Information will be provided on this tab after the installation of the Flare Gas Recovery System project at the Ethylene Flare

5-Annual Emissions

Site: Orange, TX
Semi-Annual Reporting Period: January 1, 2022 - June 30, 2022

Note: Annual emissions for Year 2022 are not reported in this semi-annual report. They will be reported in the semi-annual report that is due on March 31, 2023

6-Reportable Flaring Incidents

Summary of Reportable Flaring Incidents

Site: Orange, TX

Semi-Annual Reporting Period: January 1, 2022 - June 30, 2022

Note: Each Reportable Flaring Incident is summarized on a separate row.

Note: Lbs. of VOC or HAP emitted are after combustion in the flare.

Covered Flares at Orange, TX	Date(s)	Duration (hours)	Amount of VOC emitted (lbs.)	Amount of HAPs emitted (lbs.)	Root Cause(s)	Corrective actions(s) completed	Corrective actions(s) still outstanding	An analysis of any trends identified by the Applicable Defendant(s) in the number of Reportable Flaring Incidents, the root causes, or the types of corrective action(s).
Orange, TX - Ethylene	6/10/2022 - 7/7/2022	625.5	25.97	0.08	<p>The flare has instrumentation to measure Hydrogen, Nitrogen, Methane, Carbon Monoxide, Carbon Dioxide and water in order to exclude these compounds from the reportable flaring incident calculation.</p> <p>The online analyzer had an undetected failure so that these compounds could not be measured and excluded resulting in a calculated flow above the threshold. There were no unexpected process flows or incidents at this time.</p>	<p>Analyzers were restored and returned to service.</p> <p>An alert for when the composition is out of range was added to the control panel.</p>	No corrective actions still outstanding.	No trends identified.

7-Fenceline Monitoring Reports

Information on fenceline ambient air monitoring that was provided between June 10, 2022 and June 30, 2022 is provided on this tab.

Site: Orange, TX
Semi-Annual Reporting Period: January 1, 2022 - June 30, 2022

Note: Sampling results from the sorbent tubes that were retrieved on July 5, 2022 are not available due to an error in sample analysis at the third party laboratory.

Orange, TX
Sabine River Operations Site
Fenceline Monitoring Program

Sample Name	SAB_AMP-01	SAB_AMP-02	SAB_AMP-03	SAB_AMP-04	SAB_AMP-05	SAB_AMP-06	SAB_AMP-07	SAB_AMP-08	SAB_AMP-09
Date of Retrieval	Benzene Sample Results ($\mu\text{g}/\text{m}^3$)								
6/21/2022	1.27	1.15	1.34	1.01	40.8	2.44	4.96	M	0.822
7/5/2022	M	M	M	M	M	M	M	M	M

Sample Name	SAB_AMP-10	SAB_AMP-11	SAB_AMP-12	SAB_AMP-13	SAB_AMP-14	SAB_AMP-15	SAB_AMP-16	SAB_AMP-17	SAB_AMP-18
Date of Retrieval	Benzene Sample Results ($\mu\text{g}/\text{m}^3$)								
6/21/2022	0.835	1.86	0.978	1.57	1.00	1.22	0.818	0.664	1.26
7/5/2022	M	M	M	M	M	M	M	M	M

Annual Average ΔC **	NA	$\mu\text{g}/\text{m}^3$
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** Annual Average ΔC = The rolling average of the 26 previous 14 day sampling periods. This will be calculated after data from 26 sampling periods are available.

M: Results are not available due to a laboratory error.

List of Covered Flares in Consent Decree

Freeport, TX - LHC-7 Large FS-1
Freeport, TX - LHC-8 Elevated FS-1
Freeport, TX - LHC-8 Ground GF-500
Freeport, TX - LHC-8 Small FS-1018
Freeport, TX - Marine Large FS-1
Freeport, TX - Marine Octene FS-100
Freeport, TX - PDC
Freeport, TX - Poly 3
Freeport, TX - Poly 4
Freeport, TX - Poly Pilot Plant
Hahnville, LA - Acrylics
Hahnville, LA - Butanol 1
Hahnville, LA - Butanol 2
Hahnville, LA - EO Site Logistics
Hahnville, LA - Olefins 1
Hahnville, LA - Olefins 2
Hahnville, LA - Oxide Emergency
Hahnville, LA - SPU
Orange, TX - CDG
Orange, TX - Ethylene
Plaquemine, LA - LHC-2
Plaquemine, LA - LHC-3
Plaquemine, LA - LHC Tank Farm
Plaquemine, LA - Poly A
Plaquemine, LA - Poly B
Plaquemine, LA - Poly C